The NIST SAMATE Project

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What is the Project?

- **Software Assurance Metrics And Tool Evaluation (SAMATE) project is sponsored in part by DHS**
- **Research metrics to assess the effectiveness of tools and techniques for software assurance**
- **Leads to improved tools and provides assurance to users of the benefits of the tools**

- **Web site http://samate.nist.gov/**

Current Areas of Concentration

- **Web application scanners**
- **Source code security analyzers**
- **Work with MITRE and others to define "ground truth" for software assurance**
- **Tool effectiveness studies**
  - **Including SATE**
- **Software labels**

Moving Forward

- **Develop additional test suites for assessing web application scanners**
- **Investigate deeper problems in source code analysis during annual Static Analysis Tool Exposition (SATE)**
- **More precisely describe weaknesses, etc.**
- **Improve utility of the SAMATE Reference Dataset (SRD) repository through:**
  - **Providing guidance in running tools against test cases**
  - **Establishing quality levels of many test cases**
  - **Broadening content in areas of language, size, and application**

Further Out

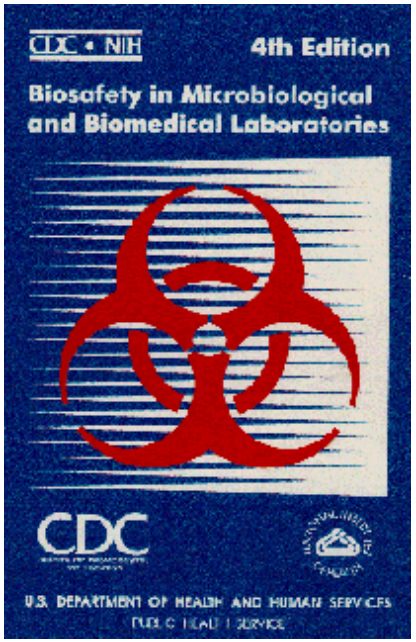
- **Binary analyzers**
- **Higher level (design & architecture) tools**
- **Statistical analysis and mathematical modeling, e.g., bug rediscovery and capture/recapture with non-uniform distributions**

Static Analysis Tool Exposition (SATE) Overview

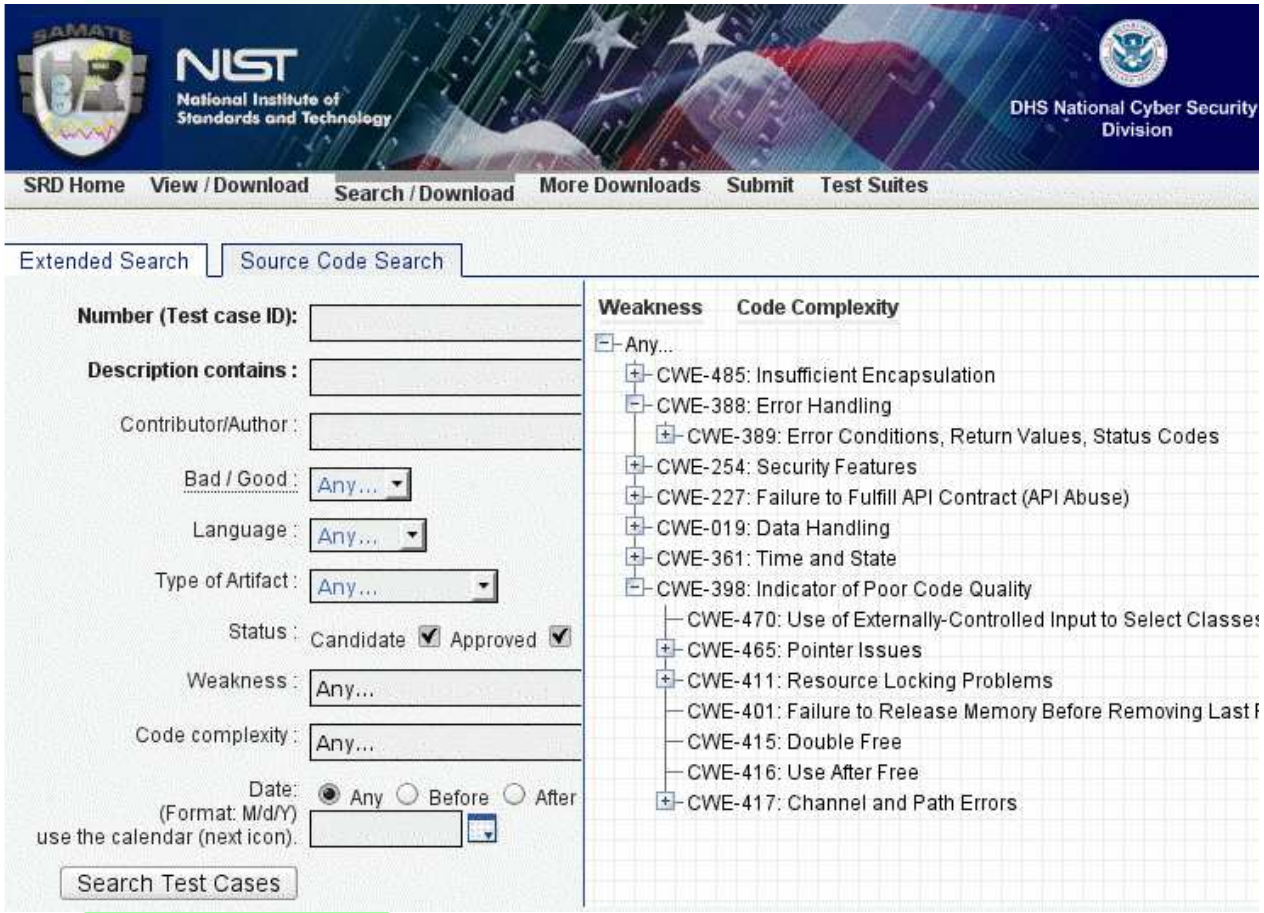
- **Advance research in, and improvement of, static analysis tools for security-relevant defects and speed tool adoption by demonstrating their use on real software.**
- **Briefly, participants run their tools on chosen programs. NIST-led researchers analyze tool reports. Results and experiences are shared at a workshop. The tool reports and analysis are made publicly available later.**
- **2008 Participants:**
  - **Aspect Security ASC**
  - **Checkmarx CxSuite**
  - **Flawfinder**
  - **Fortify SCA**
  - **Grammatech CodeSonar**
  - **HP DevInspect**
  - **SofCheck Inspector for Java**
  - **UMD FindBugs**
  - **Veracode SecurityReview**
- **2009 Participants:**
  - **Armorize**
  - **Checkmarx CxSuite**
  - **Coverity**
  - **Grammatech CodeSonar**
  - **Klocwork**
  - **LDRA**
  - **SofCheck Inspector for Java**
  - **Veracode SecurityReview**
- **2010: Organizing meeting this morning**

Researching Risky Software

- **Many people research malware, but there are no widely accepted protocols.**
- **Biological research has defined levels with associated practices, safety equipment, and facilities.**
- **Some approaches are**
  - **Weakened programs (auxotrophs)**
  - **Programs that ALERT**
  - **Outgoing firewalls**
  - **Isolated networks**



Software Reference Dataset



- **Public repository for software test cases**
- **Almost 1800 cases in C, C++, Java, and Python**
- **Search and compose custom Test Suites**
- **Contributions from Fortify, Defence R&D Canada, Klocwork, MIT Lincoln Laboratory, Praxis, Secure Software, etc.**